All claims stand rejected under 35 U.S.C. § 103(a) in view of U.S. Patent No. 4,467,034 ("Voelskow"), U.S. Patent No. 5,252,473 ("Walkup") and PCT App. WO 95/32301 ("Hammond"). Applicants respectfully traverse this rejection.

Voelskow. Voelskow discusses a process for producing lactic acid bound with alkali or alkaline earth metal hydroxides or carbonates (col. 2, lines 32-36). From the salt produced, lactic acid can be isolated using sulfuric acid or ion exchange, specifically **anion** exchange. In Example 5, Voelskow teaches and describes the use of the anion exchanger as follows:

> The sodium lactate solution obtained was led through ion exchanger columns which adsorbed the lactic acid. As soon as a column was loaded with lactic acid, it was eluted with hydrochloric acid. After regeneration with dilute sodium hydroxide solution, the column could be reused for lactic acid absorption. (col. 5, line 29 – col. 6, line 3).

In an anion exchanger, the exchangeable ions are negatively charged. Thus, the anion exchanger of Voelskow works in the following steps (with sodium used as the illustrative alkali or alkaline earth metal):

1) $Na^+ La^-$ + anion exchanger ($M^+ OH^-$) => $M^+ La^-$ + NaOH
Absorb lactic acid onto anion exchanger

2) $M^+ La^-$ + HCl => HLa (lactic acid) + $M^+ Cl^-$
Elute lactic acid from anion exchanger

3) $M^+ Cl^-$ + NaOH => $M^+ OH^-$ + NaCl
Regenerate anion exchanger

As illustrated above, the lactic acid anion is first absorbed and then eluted from a solid anion exchange column in Voelskow.

The Claimed Invention. In contrast, pending independent claims 37 and 40 recite "contacting said aqueous solution with a protonated cation exchanger." A cation exchanger has positively charged mobile ions available for exchange. Thus, the pending claims recite the use of a **cation** exchanger, exactly the opposite of that taught in Voelskow.

The steps of a cation exchanger may be shown as follows (with sodium and ammonium hydroxide used for this illustrative example):

1) $Na^+ La^-$ + protonated cation exchanger ($H^+ B^-$) => HLa (lactic acid) + NaB
Formation of lactic acid by interaction with cation exchanger

2) NaB + NH_4OH => protonated cation exchanger (H+ B-) + NaOH + NH_3
Regenerate cation exchanger, producing basic form of cation of lactate salt

As can be seen, the use of a **cation** exchanger produces lactic acid directly, and use of the exchanger requires fewer process steps.

Walkup. Walkup discusses a process for producing lactic acid esters, and additionally discusses converting the lactic acid esters to acrylic acid esters, acrylic acid, or lactic acid. The conversion of lactic acid ester to lactic acid is discussed at col. 14, lines 22-61. This process involves hydrolysis of the lactic acid ester at increased temperature and pressure, using a highly acidified ion exchange resin as a catalyst for the reaction. The catalyst is not changed or modified by the reaction.

This is far different than that described in the present application, and as claimed in pending claims 37 and 40. The process is different for at least the following reasons: (1) the concentrated or purified lactic acid ester solution of Walkup is not "an aqueous solution containing a water-soluble lactic salt"; (2) the catalyst of Walkup does not form "a cation exchanger having cations bound thereto, said cations being derived from said lactate salt"; and (3) there is no regeneration necessary in Walkup, as the ion exchange resin functions as a catalyst.

Hammond. Hammond discusses a continuous process for producing organic acids or salts, including lactic acid. As described, a "lactic acid-containing solution withdrawn from the bioreactor is passed through a column of an anion exchanger, to which column the acid is bound." (page 4, lines 3-9). Similar to that discussed above, the negatively charged lactic acid portion is bound to the anion exchanger. It is then eluted from the anion exchanger using sodium hydroxide, forming sodium lactate. Hammond does go on to mention that if lactic acid is desired, the sodium lactate solution may be passed through a cation exchanger. However, Hammond also teaches that the cation exchanger is regenerated by HCl solution. Thus, during regeneration of the resin following treatment, NaCl is the produced species. This neutral salt is very different than the claimed second product, which is a "basic form of said cation of said lactate salt."

The combination of Voelskow, Walkup, and Hammond has been cited, but there has been no showing of a motivation to combine the references. "The showing of a motivation to combine must be clear and particular, and it must be supported by actual evidence." *Teleflex,*

Inc. v. Ficosa North American Corp., 299 F.3d 1313, 1334 (Fed. Cir. 2002). No such evidence has been produced or cited.

Indeed, as each reference details a different process, there would be no need or desire to add steps of the other references, as they would not assist in formation of the desired product. To the contrary, the modification of the primary reference, Voelskow, through use of a cation exchanger would change the principle of operation of the primary reference, which is impermissible. See MPEP Section 2143.01 (VI) ("If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.")

Furthermore, even if the references are combined, they fail to suggest, teach, or disclose the process as claimed. As described, Voelskow teaches the use of an **anion** exchanger, which functions completely differently and opposite to the **cation** exchanger of the pending claims. Neither Walkup nor Hammond make up for the deficiencies of Voelskow, as discussed above. Therefore, applicants request that the rejection be withdrawn, and all claims allowed.

In view of the above, it is respectfully submitted that all rejections and objections of record have been overcome and that the application is now in allowable form. An early notice of allowance is earnestly solicited and is believed to be fully warranted.

Respectfully submitted,

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